

JAPAN

EDICT OF GOVERNMENT

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JIS B 6548 (1991) (English): Hot presses -- Test and inspection methods

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*The citizens of a nation must
honor the laws of the land.*

Fukuzawa Yukichi

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JAPANESE INDUSTRIAL STANDARD

**Hot presses — Test and
inspection methods**

JIS B 6548—1991

Translated and Published

by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

JAPANESE INDUSTRIAL STANDARD

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Hot presses - Test and inspection methods

B 6548-1991

1. Scope

This Japanese Industrial Standard specifies the construction, nominal sizes, functional tests, running tests, and methods for accuracy inspections and machining accuracy inspections of the hot presses for the woody boards of 1800 mm x 900 mm x 35 mm or over to 4300 mm x 1800 mm x 70 mm or under in dimensions of hot platens⁽¹⁾.

Note (¹) The size of hot platen means the length of longer side x length of shorter side x thickness.

Remarks 1. The applicable standards to this Standard are as given in the following:

JIS B 0659 Roughness comparison specimens

JIS B 6521 Methods of measurements for noise emitted
by wood working machinery

JIS B 7512 Steel tape measures

2. In this Standard, the units and numerical values given in { } are in accordance with the conventional units, and are appended for informative reference.

2. Construction

The respective parts of the hot press shall have sufficient rigidity respectively, and shall be those which are not inflicting ill influence on the machining accuracies.

3. Nominal sizes

The nominal sizes of the hot presses shall be in accordance with Table 1, being expressed by the dimensions of the hot platens.

Table 1. Nominal sizes

Unit: mm

Dimensions of hot platen								
Length of longer side			Length of shorter side			Thickness		
Nominal size	Dimension	Permissible values	Nominal size	Dimension	Permissible values	Nominal size	Dimension	Permissible values
1 800	1 800	±20	900	900	±20	35	35	±1
2 000	2 000		1 000	1 000		40	40	
2 100	2 100		1 100	1 100		45	45	
2 300	2 300		1 150	1 150		50	50	
2 400	2 400		1 300	1 300		55	55	
2 600	2 600		1 400	1 400		60	60	
2 700	2 700		1 600	1 600		65	65	
2 900	2 900		1 700	1 700		70	70	
3 050	3 050		1 800	1 800				
3 200	3 200							
3 300	3 300							
4 100	4 100							
4 350	4 350							

Remarks: The hot press is designated by the name, nominal size, number of stages and total compressive force (N) {kgf}.

Example: Hot press 2600 x 1400 x 35-20-4.9 x 10⁶ {500 x 10³}

4. Methods of functional tests

The functional tests of the hot press shall be in accordance with Table 2.

Table 2. Functional tests

Number	Test item	Test method
1	Electric system	Examine the insulation condition once each before and after the running test.
2	Heating system	Examine the reliabilities of functions of magnet valve, steam trap and so on.
3	Cooling system	Examine the smoothness and reliability of function.
4	Hydraulic system	Examine the reliabilities of functions of oil tightness, pressure regulation and so on.
5	Vertical movement of ram	Examine the reliability and smoothness of operation.
6	Safety device	Examine the reliabilities of safety functions for operators and of protecting functions for machine.
7	Lubricating oil system	Examine the reliabilities of functions of oil tightness, adequate distribution of oil and so on.
8	Accessories	Examine the reliabilities of functions.

Remarks: For a hot press which is not provided with any one of the foregoing functions, the test item corresponding to this in Table 2 shall be omitted.

5. Methods for load running tests

Allow the ram to operate, continue running for 30 to 60 min, and carry out inspection on each item specified in Table 3. In this case, measure each item specified in Table 4 Record Form 1 to record, as well as observe abnormal vibrations by the sense of touch.

Furthermore, the measurement of noise shall be in accordance with JIS B 6521.

Table 3. Load running tests

No.	Inspection item	Measuring method	Permissible values	
			Class 1	Class 2
1	Reciprocal variation on temperatures of hot platens	Allow the movable surface plate to operate, heat hot platens by the saturated steam of about 0.3 MPa {3 kgf/cm ² } under closed condition of each hot platen interval, measure the temperature of each hot platen at vicinity of steam outlet when the steady condition ⁽²⁾ has been attained, and consider the maximum difference of the readings of thermometer to be the measured value.	5°C	7°C
2	Degree of pressure drop	Apply the working pressure and leave it standing, carry out 3 times or more of measurements of pressure drop after a lapse of one minute, and consider mean value of thereof to be the measured value ⁽³⁾ .	10 % of working pressure	

Note ⁽²⁾ A steady condition mentioned herein means that condition where the temperatures at the inlet and outlet of the steam have been stabilized respectively. The hot platen shall be measured on each piece individually.

Furthermore, this measurement shall be carried out under the condition applying no negative pressure to the steam trap.

⁽³⁾ In the case where pressing is carried out, a woody plate of the same size as of the hot platen suitable to the inspection shall be inserted into each stage.

Table 4. Record Form 1

Number	
Time of measurement hr. min	
Heat source	Type
	Pressure MPa or {kgf/cm ² }
	Temperature °C
Temperature of cooling source °C	
Time required for platens to reach a specified temperature min	
Temperature of each platen at the position near the outlet °C	
Lifting time of movable surface plate until the hot platen of the top stage is pushed up sec	
Pressure MPa {kgf/cm ² }	When the top hot platen is pushed up Electric power required
Voltage V	
Current A	
Input kW	Pressing Electric power required
Pressure MPa {kgf/cm ² }	
Voltage V	
Current A	
Input kW	Working oil
Time required to raise pressure sec	
Time required to sink the movable surface plate sec	
Classification	Noise A-weighted dB
Temperature °C	
Room temperature °C	
Description	

Remarks: The conditions of noise measurement shall be recorded in the description column.

6. Methods for inspection on accuracies

The inspection on accuracies of the hot press shall be in accordance with Table 5.

Table 5. Inspection on accuracies

No.	Inspection item	Measuring method	Figure for measuring method	Permissible values	
				Grade 1	Grade 2
1	Unevenness on thickness of hot platen	Measure the thicknesses, at least at 9 points as given in Figure, of the hot platen with a test indicator or a micrometer, and consider the maximum difference of readings thereof to be the measured value.		$0.03 + \frac{0.025^{(4)}}{1000} L_1$	$0.04 + \frac{0.040^{(4)}}{1000} L_1$
2	Straightness of hot platen	Place a hot platen on a horizontal surface plate ⁽⁵⁾ , place a straightedge at least on the lines as given in Figure, using the two supports of the equal thickness, allow the test indicator which has been applied to this to slide on the upper surface of the hot platen, and consider the maximum difference of the readings of the test indicator, at least at 3 points of the center and both ends respectively, to be the measured value.		$0.02 + \frac{0.050^{(6)}}{1000} L_2$	$0.02 + \frac{0.060^{(6)}}{1000} L_2$

Table 5 (Continued)

Unit: mm

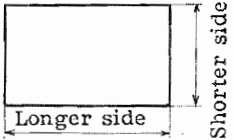
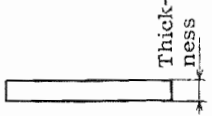
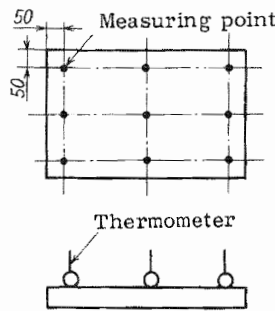
No.	Inspection item		Measuring method	Figure for measuring method	Permissible values	
					Grade 1	Grade 2
3	Dimensions of hot platen	Length of side	Measure the lengths of the longer side and shorter side of each hot platen with a steel tape measure ⁽⁷⁾ , and consider the difference between the specified lengths of side ⁽⁸⁾ and these to be the measured value.		1.0	1.0
		Thickness	Measure the thickness of each hot platen with vernier calipers ⁽⁹⁾ , and consider the difference between the specified thickness ⁽⁸⁾ and this to be the measured value.		1.0 (It shall not be a negative value.)	1.0 (It shall not be a negative value.)
4	Surface roughness of hot platen surface		Measure the surface roughness of a hot platen surface by comparing with the roughness comparison specimen ⁽¹⁰⁾ .		3.2a	3.2a
5	Unevenness of temperature on hot platen surface		Heat a hot platen by the steam of approx. 0.3 MPa {3 kgf/cm ² } in saturated vapour pressure, measure the temperatures at least 9 points given in Figure by a thermometer after a steady state ⁽¹¹⁾ has been attained, and consider the maximum difference of readings to be the measured value.		3°C	3°C

Table 5 (Continued)

Unit: mm

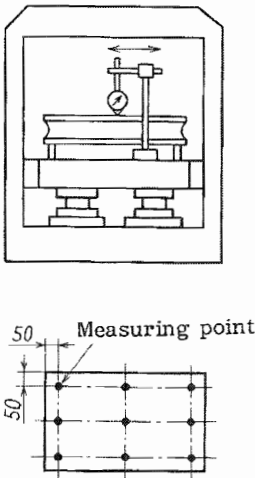
No.	Inspection item	Measuring method	Figure for measuring method	Permissible values	
				Grade 1	Grade 2
6	Straightness of movable surface plate surface	Place a straightedge at least on the lines given in Figure of the movable surface plate surface, using two supports of equal thickness, allow a test indicator being applied to this to travel by sliding on the upper surface of the movable surface plate, and consider the maximum difference of the readings of the test indicator at 3 places at least of the center and both ends respectively to be the measured value ⁽¹²⁾ .		$0.02 + \frac{0.050^{(13)}}{1000} L_3$	$0.02 + \frac{0.060^{(13)}}{1000} L_3$

Table 5 (Continued)

Unit: mm

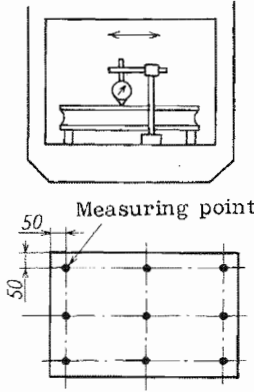
No.	Inspection item	Measuring method	Figure for measuring method	Permissible values	
				Grade 1	Grade 2
7	Straightness of surface plate surface of upper frame	Place a straightedge at least on the lines given in Figure of the surface plate surface of the upper frame, using supports of equal thickness, allow a test indicator to travel by sliding on the surface plate surface, and consider the maximum difference of the readings of the test indicator at least at 3 places of the center and both ends respectively ⁽¹²⁾ to be the measured value.	 <p>The figure consists of two parts. The top part is a schematic of a test indicator setup: a horizontal straightedge is supported by two vertical blocks of equal height. A test indicator with a circular probe is positioned to touch the surface of the straightedge. A double-headed arrow above the straightedge indicates its length. The bottom part is a 3x3 grid of points. The top-left point is labeled 'Measuring point' with a line pointing to it. The horizontal distance from the left edge to the first vertical line of points is labeled '50'. The vertical distance from the top edge to the first horizontal line of points is also labeled '50'.</p>	$0.02 + \frac{0.050^{(14)}}{1000} L_4$	$0.02 + \frac{0.060^{(14)}}{1000} L_4$

Table 5 (Continued)

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Unit: mm

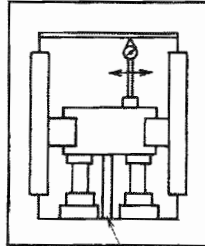
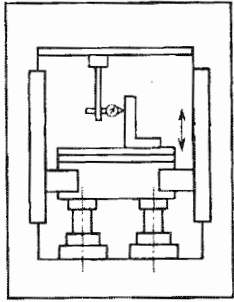
No.	Inspection item		Measuring method	Figure for measuring method	Permissible values	
					Grade 1	Grade 2
8	Parallelism of movable surface plate to surface plate surface of upper frame	Longer side direction	Support the lower surface of the movable surface plate by supporting bars at 2 places of about center of the longer side, allow a test indicator which has been placed on the movable surface plate surface or a straightedge on the movable surface plate surface to travel applying to the upper frame surface plate surface, and consider the maximum difference of the readings of the test indicator to be the measured value ⁽¹⁵⁾	 Supporting bar	$1 + \frac{0.500^{(16)}}{1000} L_5$	$2 + \frac{1.000^{(16)}}{1000} L_5$
		Shorter side direction	Support the lower surface of the movable surface plate by supporting bars at 2 places of about center of the shorter side, allow a test indicator which has been placed on the movable surface plate surface or a straightedge on the movable surface plate to travel applying to the upper frame surface, and consider the maximum difference of the readings of the test indicator to be the measured value ⁽¹⁵⁾ .		$1 + \frac{0.500^{(16)}}{1000} L_6$	$2 + \frac{1.000^{(16)}}{1000} L_6$

Table 5 (Continued)

Unit: mm

No.	Inspection item		Measuring method	Figure for measuring method	Permissible values	
					Grade 1	Grade 2
9	Perpendicularity of vertical motion of movable surface plate to surface plate of upper frame	Longer side direction	Place a straightedge at about the center of the longer side of the movable surface plate, stand a square on it, allow the movable surface plate to travel in vertical direction, applying a test indicator which has been attached to the upper frame, and consider the maximum difference of the readings of the test indicator to be the measured value.		$1 + \frac{0.08}{100} L_7^{(17)}$	$1 + \frac{0.08}{100} L_7^{(17)}$
		Shorter side direction	Place a straightedge at about the center of the shorter side of the movable surface plate, stand a square on it, allow the movable surface plate to travel in vertical direction, applying a test indicator which has been attached to the upper frame, and consider the maximum difference of the readings of the test indicator to be the measured value.		$1 + \frac{0.05}{100} L_8^{(17)}$	$1 + \frac{0.05}{100} L_8^{(17)}$
10	Clearance between hot platens		Measure the clearance between the stages from each other with vernier calipers, and consider the difference between this clearance and the specified clearance dimension ⁽⁸⁾ to be the measured value.		2	2

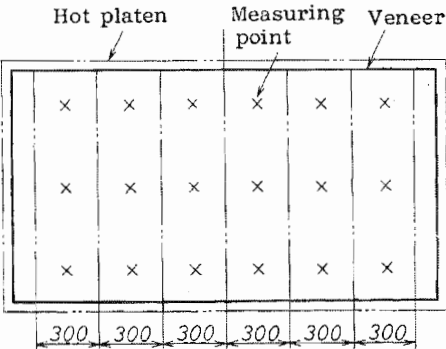
- Notes (⁴) L_1 indicates the length of a diagonal of the hot platen surface.
- (⁵) This means a surface plate or a plate equivalent to it.
- (⁶) L_2 indicates the measured length of the hot platen.
- (⁷) This shall conform to Grade 1 specified in JIS B 7512.
- (⁸) The side length, thickness and the clearance dimension shall be determined upon agreement between the parties concerned.
- (⁹) The readings taken in No. 1 may also be used.
- (¹⁰) This shall conform to JIS B 0659.
- (¹¹) A steady state is a state in which the steam temperatures at the inlet and outlet are stabilized. Take measurements on each hot platen.
- (¹²) The measurement shall be made in the same position as in No. 1.
- (¹³) L_3 indicates the measured length of the movable surface plate.
- (¹⁴) L_4 indicates the measured length of the surface plate surface of the upper frame.
- (¹⁵) Any length of the supporting bar (measured height) may be used. The supports shall be loaded with only self weights of the movable surface plate and the ram.
- (¹⁶) L_5 and L_6 indicate the measured length of the surface plate surface of the upper frame. The measurement may be made at any height.
- (¹⁷) L_7 and L_8 indicate the measurable stroke length (mm) of the movable surface plate.

Remarks: The maximum difference means the difference between the maximum and the minimum values obtained by the designated measuring method.

7. Method of machining accuracy inspection

The machining accuracy inspection of the hot press shall be in accordance with Table 6.

Table 6. Machining accuracy inspection

In- specification item	Measuring method	Figure for measuring method	Permissible value	
			Grade 1	Grade 2
Unevenness on thickness	Insert a sheet of veneer of equal to in size of hot platen surface ⁽¹⁸⁾ , press it ⁽¹⁹⁾ , measure ⁽²¹⁾ the thickness of each measuring point ⁽²⁰⁾ after pressing with an outside micrometer, and consider the quotient of the maximum difference of readings divided by the mean value of measured values to be the measured value. Carry out this measurement at least on three stages of the upper stage, middle stage and lower stage of the hot press.		0.10	0.12

Notes ⁽¹⁸⁾ This means the maximum working surface.

⁽¹⁹⁾ The pressing conditions of the hot press shall be as follows.

1. Working pressure for pressing
2. Working time interval for pressing shall be 1 minute per 1 mm of veneer thickness.
3. Working temperature for pressing

⁽²⁰⁾ The measuring points shall be in accordance with the Figure for measuring method.

⁽²¹⁾ The measurement shall be carried out after the veneer has been cut to 300 mm.

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